Something to make

*Have fun making a fun, game-playing object. Then use it to have a go at making some outcomes more likely than others.*

**Fortune Teller**

**You will need:**
Several pieces of square of paper, some good coloured felt-tips.

[To make a suitably sized piece of square paper use an A4 sheet, folding across from a corner diagonally to the opposite side, then cutting off the surplus rectangle.]

**How to make it:**

- Fold your piece of paper along the diagonals.
- Press down so the creases are sharp.
- Open up the paper and then fold each corner into the middle.
- All four corners are now in the centre and you have a smaller square.
- Turn the smaller square over so the folds are underneath.
- Repeat the above process, folding all the corners in to the centre.
- You should now have an even smaller square.
- Turn the square over so the folds are underneath
- Fold the square in half and press the fold down so it is a sharp crease.
- Fold the square in half the other way, and press the fold down.
You should now have a fortune teller!

- Place it flat on the table.
- Write numbers on the squares.
- Turn it over and colour the triangles.
- Each one should be a different colour.
- Now lift each triangle and write an instruction underneath it. Each one should have a different instruction. See suggestions below... OR think up your own!
- Fold it all back as it was, insert your thumbs and ask someone to choose a number.

**Suggested Instructions**

- Marry a frog.
- Eat beans for breakfast.
- Walk across the room on tip-toe.
- Say *red jelly yellow jelly* three times in a row!
- Do 10 star jumps
- Write your name backwards.
- Pretend you are a sloth.
- Pull your funniest face.

*Write really weird humorous instructions to make it fun to use your fortune teller!*

*Try these sites for further instructions, if these above are not clear.*

https://www.youtube.com/watch?v=A42wubu8pJA
https://www.youtube.com/watch?v=BxyXk1sr2io

Follow the instructions to make a fun fortune teller.
You can use the eight suggested actions or make up some fun ones of your own.
Try out the fortune teller on someone!
Now answer some questions about how likely you are to get each instruction.

- What numbers have you written on the squares?
- Does this make it more or less likely that one set of four coloured triangles will come up more often than the other set?
- Can you ‘cheat’ by opening the fortune teller in a particular way?
- Can you increase the chances of a person getting a particular instruction, e.g. *Pretend to be a sloth*? How do you make this more likely?

Now let’s explore the probabilities by making another fortune teller.

- On the top four squares, write the numbers 1, 2, 3 and 4. This makes it easier to predict which set of triangles you will get.
- Colour the eight triangles alternately using just two colours, e.g. red and blue.
- On the underside of the eight triangles, write the following eight numbers (one on each flap):
  - 32
  - 55
  - 28
  - 73
  - 56
  - 64
  - 46
  - 82

**Try the fortune teller 20 times, choosing alternate red and blue triangles each time. Record the under-the-triangle number that comes up each time.**

- Did you get more **odd** or **even** numbers?
- More numbers **greater** than 80 or **less** than 80?
- What do you notice about the number of times the digits of your answer add to 10, e.g. 73: 7 + 3 = 10.
- Now look at the eight numbers again.
- How many are **greater than 80**?
- How many are **odd**?
- How many have digits that add to 10?

The chances have been fixed to get the results that you got for your list of 20 numbers. E.g. 6 of the 8 numbers are even so it was **more likely** that most of your 20 numbers would be even. (Note that it is still **possible** that you get more odd than even numbers but as only 2 of the 8 numbers are odd, it is **quite unlikely**).

**Design a final fortune teller. This time make one so that there is a very good chance (but not certain) that you will get a particular instruction!**